

## Claims

- [c1] What is claimed is:
1. A gas filter for preventing a shielding gas supplied from a gas cylinder from introducing particles exceeding a predetermined size from entering a gas solenoid valve, the gas filter comprising a housing, the housing having an inlet adapted to be connected to a gas cylinder and an outlet adapted to be connected to a gas solenoid valve, the housing having a passageway extending between the inlet and the outlet, a filter screen retained within the housing, the filter screen being located in the passageway to prevent particles exceeding a predetermined size from passing through the filter screen to reach the outlet.
  - [c2] 2. A gas filter as defined in claim 1 wherein the inlet comprises a standard female threaded fitting and the outlet comprises a standard male threaded fitting.
  - [c3] 3. A gas filter as defined in claim 1 wherein the filter screen is constructed of stainless steel having a plurality of micro pores formed therein.
  - [c4] 4. A gas filter as defined in claim 3 wherein the micro pores prevent passage through the filter screen of particles larger than about 100 microns.
  - [c5] 5. A gas filter as defined in claim 1 wherein the passageway is formed within the housing to have an outwardly extending internal annular recess and the filter screen is retained within the housing by being fitted within the annular recess.
  - [c6] 6. A gas filter as defined in claim 5 wherein the passageway tapers inwardly in the direction from the inlet toward the outlet to create a sharp circular edge forming one edge of the annular recess.
  - [c7] 7. A system for providing a shielding gas to a welding apparatus, the system comprising a cylinder containing a quantity of shielding gas, a gas hose having one end connected to the cylinder, a gas solenoid valve adapted to be opened and closed by means of an electrical signal, the gas solenoid valve having an inlet, a shielding gas filter having an outlet connected to the inlet of the gas solenoid valve and an inlet connected to the other end of the gas hose, the shielding gas filter having a housing, the housing having an inlet and an outlet

and a passageway extending between the inlet and the outlet, a filter screen retained within the housing, the filter screen located within the passageway to prevent particles exceeding a predetermined size from passing through the filter screen to reach the outlet.

- [c8] 8. A system as defined in claim 7 wherein the inlet of the housing comprises a female threaded fitting and the outlet of the housing comprises a male threaded fitting.
- [c9] 9. A system as defined in claim 8 wherein the filter screen is a stainless steel material having micro pores formed therein.
- [c10] 10. A system as defined in claim 9 wherein the micro pores prevent particles larger than 100 microns for passing through the micro pores.
- [c11] 11. A system as defined in claim 7 wherein the passageway is formed within the housing to have an outwardly extending internal annular recess and the filter screen is retained within the housing by being fitted within the annular recess.
- [c12] 12. A system as defined in claim 11 wherein the passageway tapers inwardly in the direction from the inlet toward the outlet to create a sharp circular edge forming one edge of the annular recess.
- [c13] 13. A method of preventing particles exceeding a predetermined size from entering a gas solenoid valve connected to a gas hose delivering a shielding gas in a welding apparatus, the method comprising the steps of:  
 providing a shielding gas filter comprising a housing having a passageway and having a gas filter screen located in the passageway,  
 disconnecting the gas hose from the gas solenoid valve,  
 connecting the shielding gas filter to the gas solenoid valve;  
 connecting the gas hose to the shielding gas filter,  
 whereby all of the gas from the gas supply passes through the shielding gas filter before entering the solenoid valve.
- [c14] 14. A method as defined in claim 13 where the step of providing a shielding gas filter comprises providing a shielding gas filter having a gas filter screen with a

plurality of micro pores formed therein.

- [c15] 15. A method as defined in claim 14 where the step of providing a shielding gas filter comprises providing a shielding gas filter having a gas filter screen with micro pores of about 100 microns.
- [c16] 16. A method as defined in claim 13 where the step of providing a gas shielding filter comprises providing a shielding gas filter having an inlet that is a female threaded fitting and an outlet that is a male threaded fitting.
- [c17] 17. A method as defined in claim 13 where the step of providing a shielding gas filter comprises providing a housing having a passageway having an outwardly extending internal annular recess formed therein and the gas filter screen is located within the annular recess.